BEFORE THE ARIZONA CORPORATION COM

COMMISSIONERS
BOB STUMP, Chairman
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

IN THE MATTER OF RESOURCE PLANNING AND PROCUREMENT IN 2013 AND 2014.

DOCKET NO. E-00000V-13-0070

SWEEP COMMENTS ON THE 2014 RESOURCE PLANS: SWEEP ANALYSIS OF IRPS

COMMENTS OF THE SOUTHWEST ENERGY EFFICIENCY PROJECT (SWEEP): SWEEP ANALYSIS OF THE ROLE OF ENERGY EFFICIENCY IN MEETING FUTURE RESOURCE NEEDS

The Southwest Energy Efficiency Project (SWEEP) appreciates the opportunity to submit comments on the 2014 Integrated Resource Plans (IRP or IRPs).

SWEEP examined the IRPs of the Arizona Public Service Company (APS) and the Tucson Electric Power Company (TEP) to explore the role energy efficiency and demand response programs play in meeting the future electric needs of the customers of both utilities. SWEEP's examinations and analyses are based entirely on the data and documentation the utilities provided in their IRPs and in their annual demand side management reports. SWEEP's analysis and findings are intended to provide additional information for the Commission's consideration of the APS and TEP 2014 IRPs.

SWEEP provides and summarizes its findings in three sections below:

1. The role of energy efficiency and demand response programs in the APS IRP.
2. The role of energy efficiency and demand response programs in the TEP IRP.
3. How energy efficiency programs meet capacity needs by building up the energy efficiency resource over time, and why this is appropriate and important.

Our key findings include the following:

1. ***APS and TEP need additional resources to meet load obligations over the next 15 years.***

2. ***Energy efficiency and demand response programs play a significant role in enabling APS and TEP to meet these obligations.***

3. ***APS and TEP both identify energy efficiency as the least expensive energy resource available to meet customer needs.***

4. ***Total costs for customers will increase if TEP and APS under-invest in the EE resources documented in their IRPs, as they will need to substitute for resources that are comparatively more expensive. If anything, APS and TEP should implement more EE than the EE Standard requires in order to meet customer needs and to keep total customer costs lower than they would otherwise be.***

5. ***EE programs meet capacity needs by building up the EE resource over time.***

6. ***EE resources should be built up over time in order to lower program and ratepayer costs.***

7. ***Cost-effective EE built up over time provides benefits today and tomorrow and helps to support and provide flexibility for new innovations and opportunities***

II. The Role of Energy Efficiency and Demand Response Programs in Arizona Public Service Company's 2014 Integrated Resource Plan

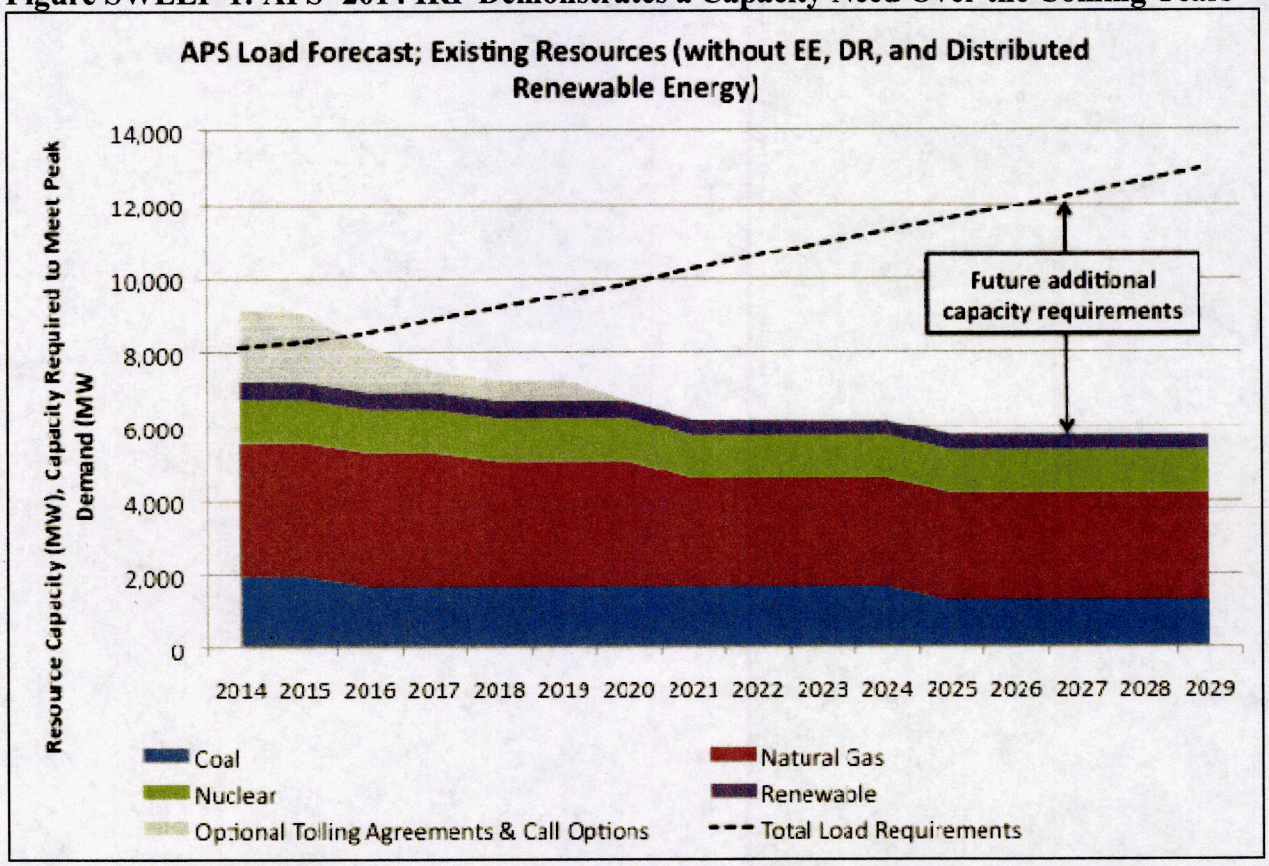
SWEEP reviewed the Arizona Public Service Company's (APS) 2014 Integrated Resource Plan (IRP) to examine the role energy efficiency (EE) and demand response (DR) programs play in meeting the future electric needs of APS customers. Below we provide a summary of our major findings for APS.

Finding #1: APS Needs Additional Energy Resources to Meet its Load Obligations

According to APS' 2014 IRP, APS will need additional capacity and energy resources to meet its load obligations over the fifteen-year planning horizon. Figure SWEEP-1 shows the capacity shortfall in more detail. The black dotted line represents APS' total capacity requirement (its firm load obligations plus a 15% planning reserve margin), based on the load forecast in APS' 2014 IRP. The colored regions below the black dotted line show the capacity contributions of APS' existing generation resources. The gray-shaded region shows the contributions of Market/Call Options and Tolling Agreements – resources that APS can ***optionally*** call upon to meet load when necessary. The gap between the black dotted line and the capacity contributions of APS' existing generation resources and optional Market/Call Options and Tolling Agreements represents the additional capacity that APS will need in order to fulfill its load obligations and

meet customer needs.

Figure SWEEP-1: APS' 2014 IRP Demonstrates a Capacity Need Over the Coming Years



Data Source: APS 2014 IRP

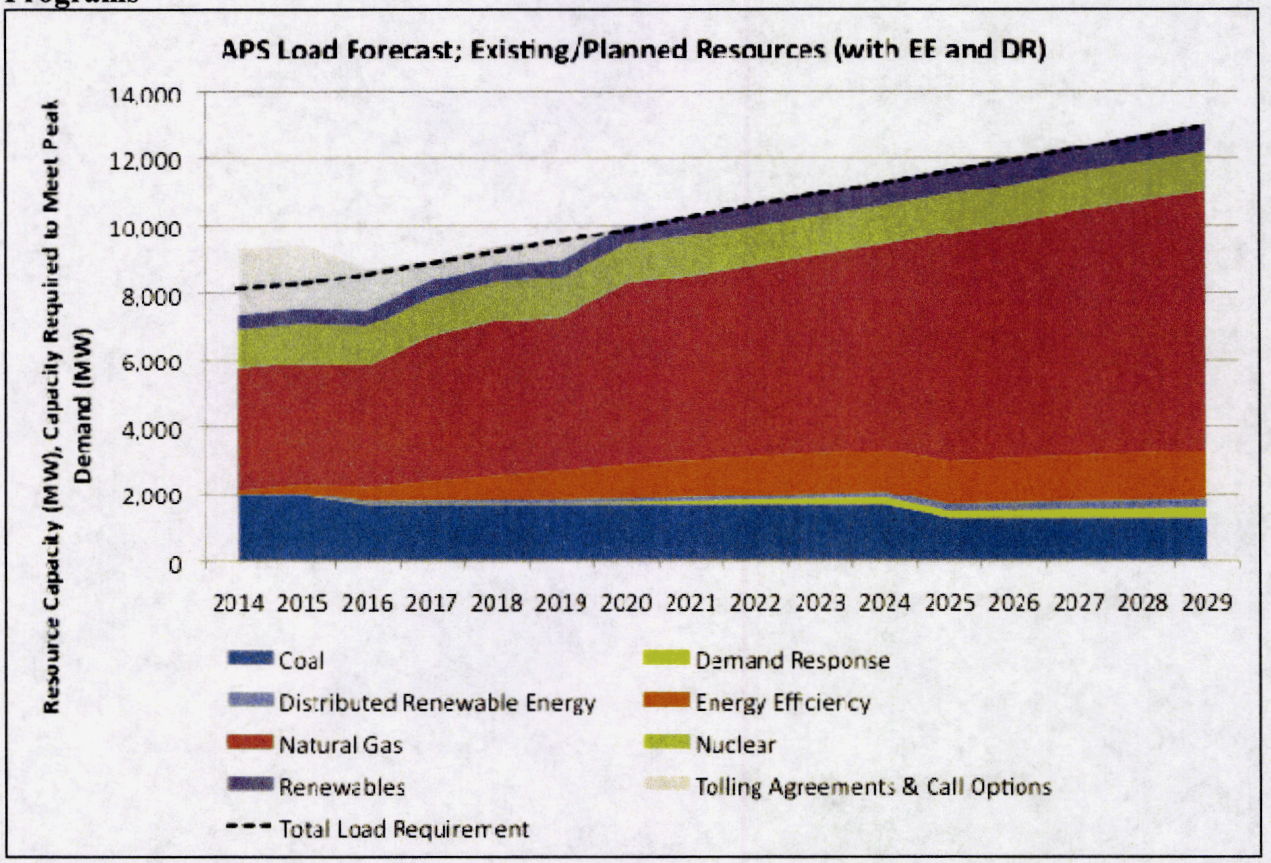
Finding #2: APS Plans to Meet Its Capacity Shortfall Through a Mixed Portfolio of Resources that Include Demand-Side EE and DR Resources

APS intends to invest in additional capacity and energy resources in order to fulfill its load obligations and meet customer needs. See Figure SWEEP-2. According to its 2014 IRP, APS plans to meet this capacity shortfall through a mixed portfolio of resource additions that include:

1) New natural gas resources (e.g. combined cycle resources and combustion/steam turbines)
2) New renewable energy resources (e.g. utility scale wind, geothermal, and solar resources)
3) New distributed renewable energy resources; and
4) Demand-side EE resources and DR, collectively called "Demand Side Management" or "DSM".

Figure SWEEP-2: APS Plans to Meet the Capacity Need Through a Mixed Portfolio of Resources, Including through EE and DR

Programs



Data Source: APS 2014 IRP

APS also has the option to call upon its Market/Call Options and Tolling Agreements to meet load when necessary. Note that in 2014-2016 it is the Market/Call Options in particular that may cause some reviewers of the APS IRP to perceive that APS has excess capacity. However, Market/Call Options, as a "resource," are fundamentally different than a natural gas plant, EE programs, or other physical resources – based on their nature and intended purpose. Market/Call Options are intended to meet demand for electricity and to provide additional capacity to meet the demand, but usually for very short periods (hours) and often at fairly high costs per MWh, and only when APS exercises the option.

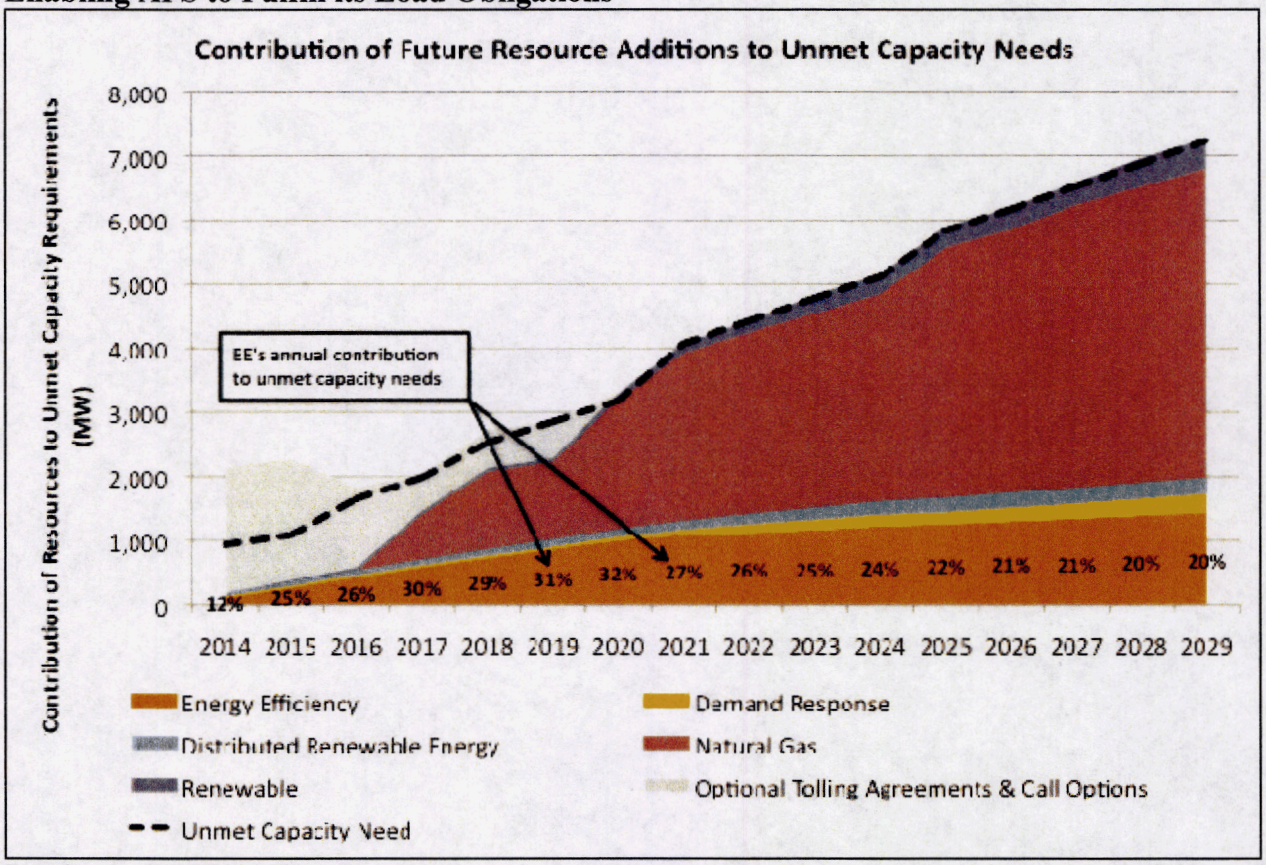
In SWEEP's view it is useful for APS to have the Market/Call Options as a tool in the toolbox, because if, for example, the peak demand in the summer exceeds the forecast demand, then APS could exercise the Market/Call Options to meet the higher-than-expected peak demand for short periods of time. But Market/Call Options should not be perceived to be the same as physical capacity resources such as generating plants or EE programs.

Finding #3: Energy Efficiency Programs Make Significant Contributions Toward Enabling APS to Fulfill its Load Obligations

EE programs make significant contributions toward APS being able to fulfill its load obligations. As shown in Figure SWEEP-3, EE programs contribute a major share of APS' future resource additions to meet capacity needs. Figure SWEEP-3 illustrates the fraction EE contributes each

year. In some years, such as 2019, EE's contribution is as high as 31%. This analysis treats Market/Call Options and Tolling Agreements as optional resources that APS can call upon to meet load when necessary — which is how APS treats these resources as well.

Figure SWEEP-3: Energy Efficiency Programs Make Significant Contributions Toward Enabling APS to Fulfill its Load Obligations



Data Source: APS 2014 IRP

Note that APS assumes in its resource plan that EE resource contributions will tail off after 2020, the final year of the EE Standard, and that less EE will be implemented post-2020. APS has not provided any documentation for this assumption. SWEEP recommends that all cost-effective EE should continue to be pursued and implemented, including after the last year of the current EE Standard.

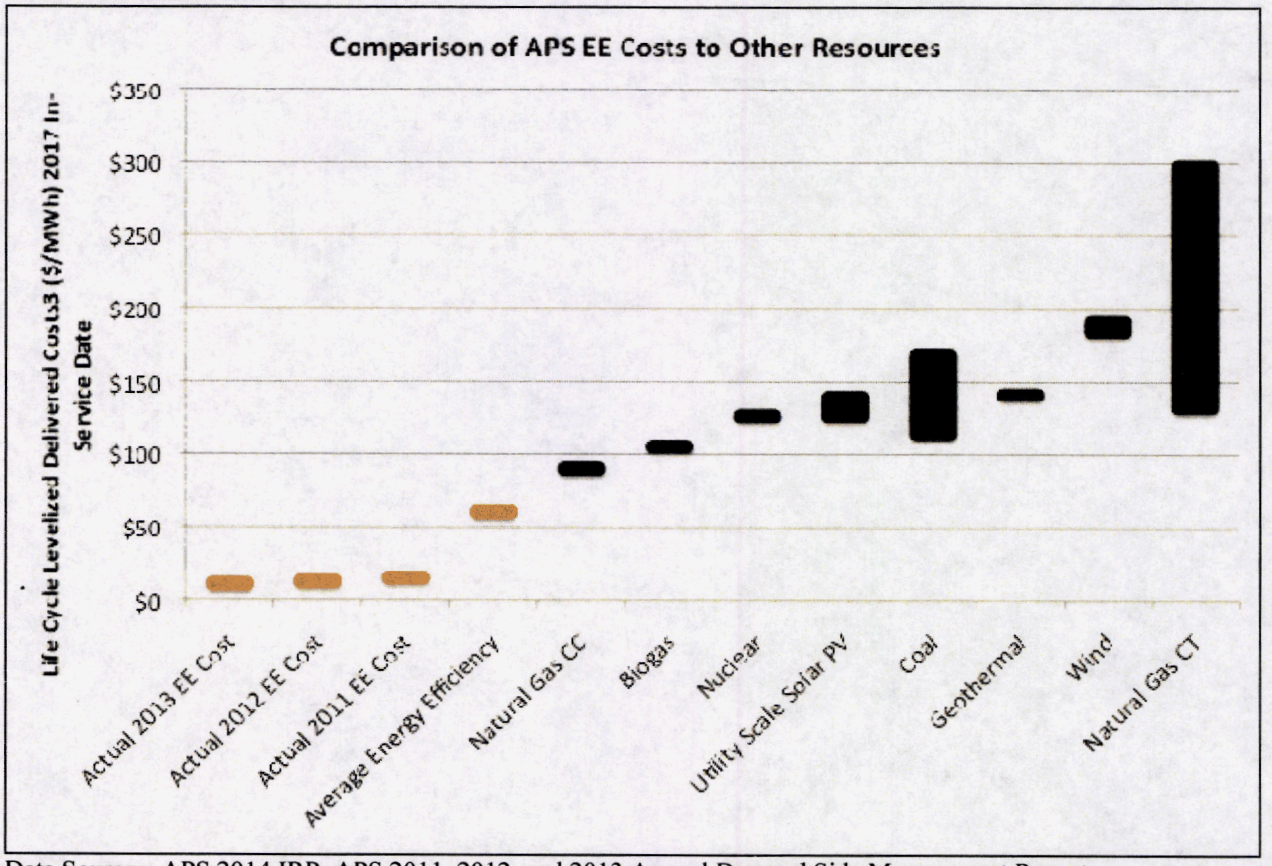
Finding #4: From a Ratepayer Perspective, Energy Efficiency is the Best and Lowest-cost Energy Resource APS Can Use to Meet the Needs of its Customers

From a ratepayer perspective, EE is the best and lowest-cost energy resource APS can use to meet the current and future needs of its customers. As shown in Figure SWEEP-4, investing in other resources would be more costly for ratepayers. For example, the cost of a natural gas combustion turbine is 2-to-4.5-times the cost of EE in APS' 2014 IRP[1]. Also, in its IRP 2014 APS is estimating EE costs that are several times the actual cost of EE in recent years (see Figure

[1] SWEEP does not agree with APS' projected EE program costs. These costs are higher than necessary and higher than what we have observed in mature DSM portfolios in other states.

SWEEP-4, at the lower left which shows APS' actual cost of EE programs from 2011-2013). EE is still the lowest cost resource even when APS estimates costs that are far higher than actual experience-to-date.

Figure SWEEP-4: Energy Efficiency is the Least Expensive Energy Resource Available to Meet Customer Needs



Data Sources: APS 2014 IRP; APS 2011, 2012, and 2013 Annual Demand Side Management Reports

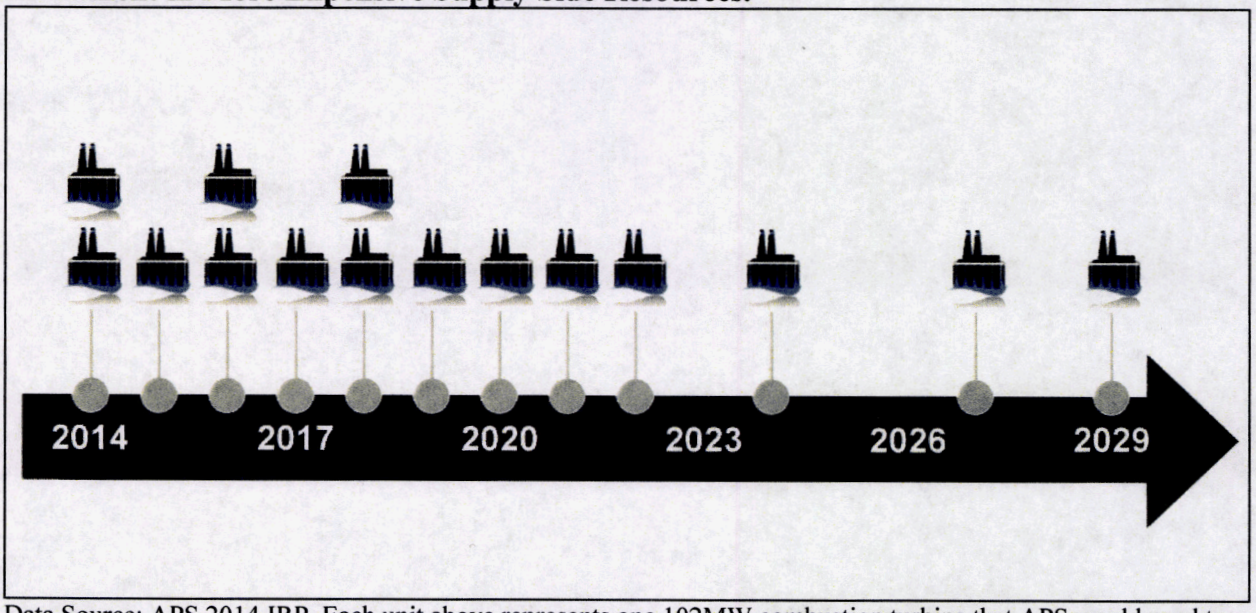
As shown in Figure SWEEP-9, APS plans to rely increasingly and significantly on natural gas to meet customer needs. For example, in 2020 the APS-planned natural gas additions are 2-times the 2020 energy efficiency addition, and in 2025 the APS-planned natural gas additions are 3-times the 2025 energy efficiency addition. Apparently this is APS' plan as represented in its IRP even though additional EE is available post-2020 and EE is much lower cost than the natural gas additions, as shown in Figure SWEEP-4.

Finding #5: APS' IRP Cleary Demonstrates the Need for Energy Efficiency Investment. Failure to Invest in Energy Efficiency will Result in Significant Investment in More Expensive Supply Side Resouces.

The APS 2014 IRP clearly demonstrates the need to invest in EE programs based on APS' actual customer needs established in the utility's 2014 IRP. If APS under-invests in the EE documented in the 2014 IRP, and then has to add other resources to substitute for the EE resources identified in the IRP, the total costs for APS customers will be significantly higher (see SWEEP-4).

For example, we examined a hypothetical scenario where EE capacity is replaced with supply-side resources. In this case we assumed the alternative supply side resource would be a 102MW combustion turbine (such as the one proposed by APS at Ocotillo). SWEEP-5 illustrates the build out of combustion turbine units necessary to provide capacity resources equivalent to the capacity provided by EE in APS' 2014 IRP. As shown in this figure, failure to invest in EE will result in significant investment in supply side resources that are comparatively more expensive. Indeed, APS would need to build 15 combustion turbines over the planning horizon and would need to commence construction immediately.

Figure SWEEP-5: Failure to Invest in Energy Efficiency will Result in Significant Investment in More Expensive Supply Side Resources.



Data Source: APS 2014 IRP. Each unit above represents one 102MW combustion turbine that APS would need to build.

III. The Role of Energy Efficiency and Demand Response Programs in Tucson Electric Power Company's 2014 Integrated Resource Plan

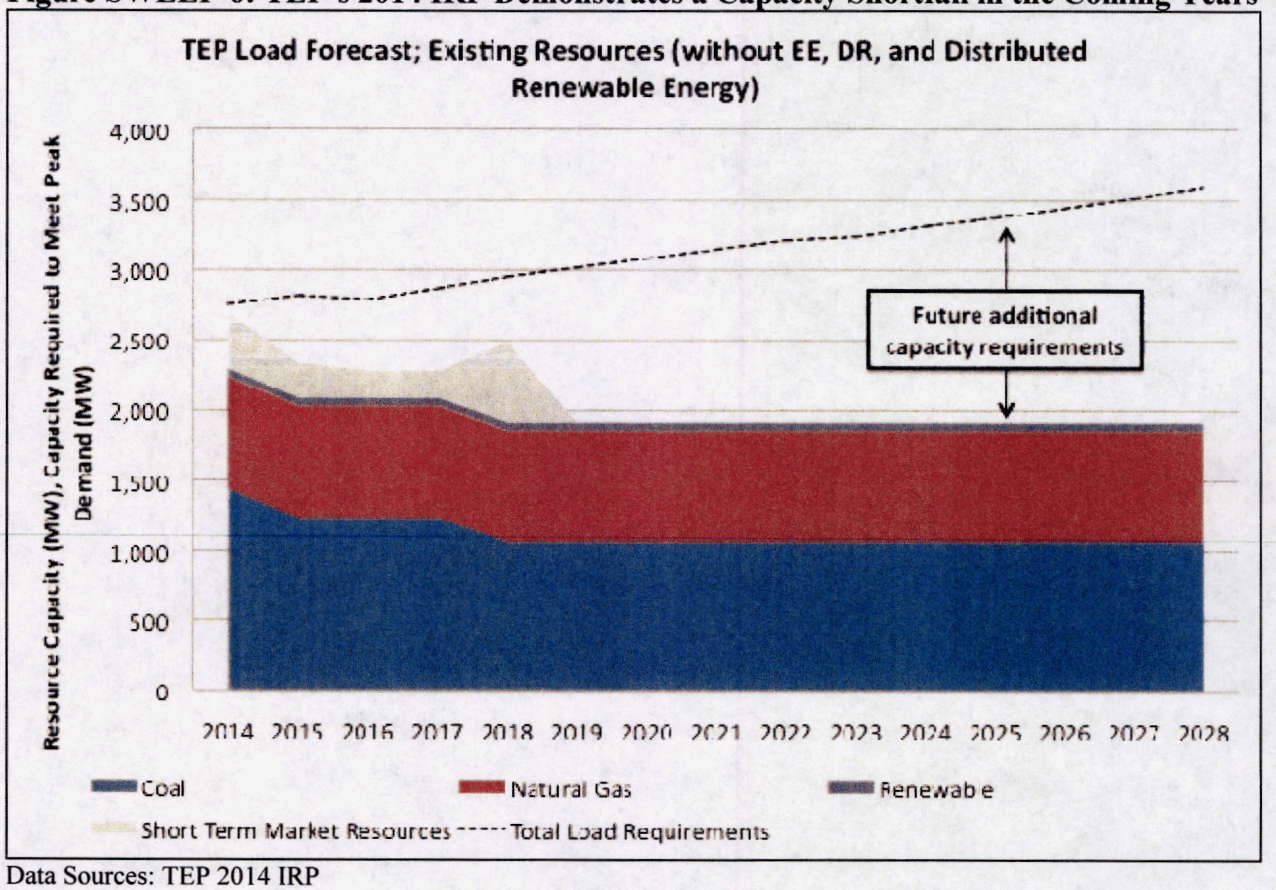
SWEEP reviewed the Tucson Electric Power Company's (TEP) 2014 Integrated Resource Plan (IRP) to examine the role energy efficiency (EE) and demand response (DR) programs play in meeting the future electric needs of TEP customers. Below we provide a summary of our major findings for TEP.

Finding #1: TEP Needs Additional Energy Resources to Meet its Load Obligations

According to TEP's 2014 IRP, TEP will need additional capacity and energy resources to meet its load obligations. Indeed, TEP's 2014 IRP clearly shows that TEP has a shortfall in generation capacity over the coming years. Figure SWEEP-6 shows this capacity shortfall in more detail. The black dotted line represents TEP's total capacity requirement (its firm load obligations plus a 15% planning reserve margin), based on the load forecast in TEP's 2014 IRP. The colored regions below the black dotted line show the capacity contributions of TEP's existing generation resources. The gap between the black dotted line and the capacity contributions of TEP's

existing generation resources represents the additional capacity that TEP will need in order to fulfill its load obligations and meet customer needs.

Figure SWEEP-6: TEP's 2014 IRP Demonstrates a Capacity Shortfall in the Coming Years



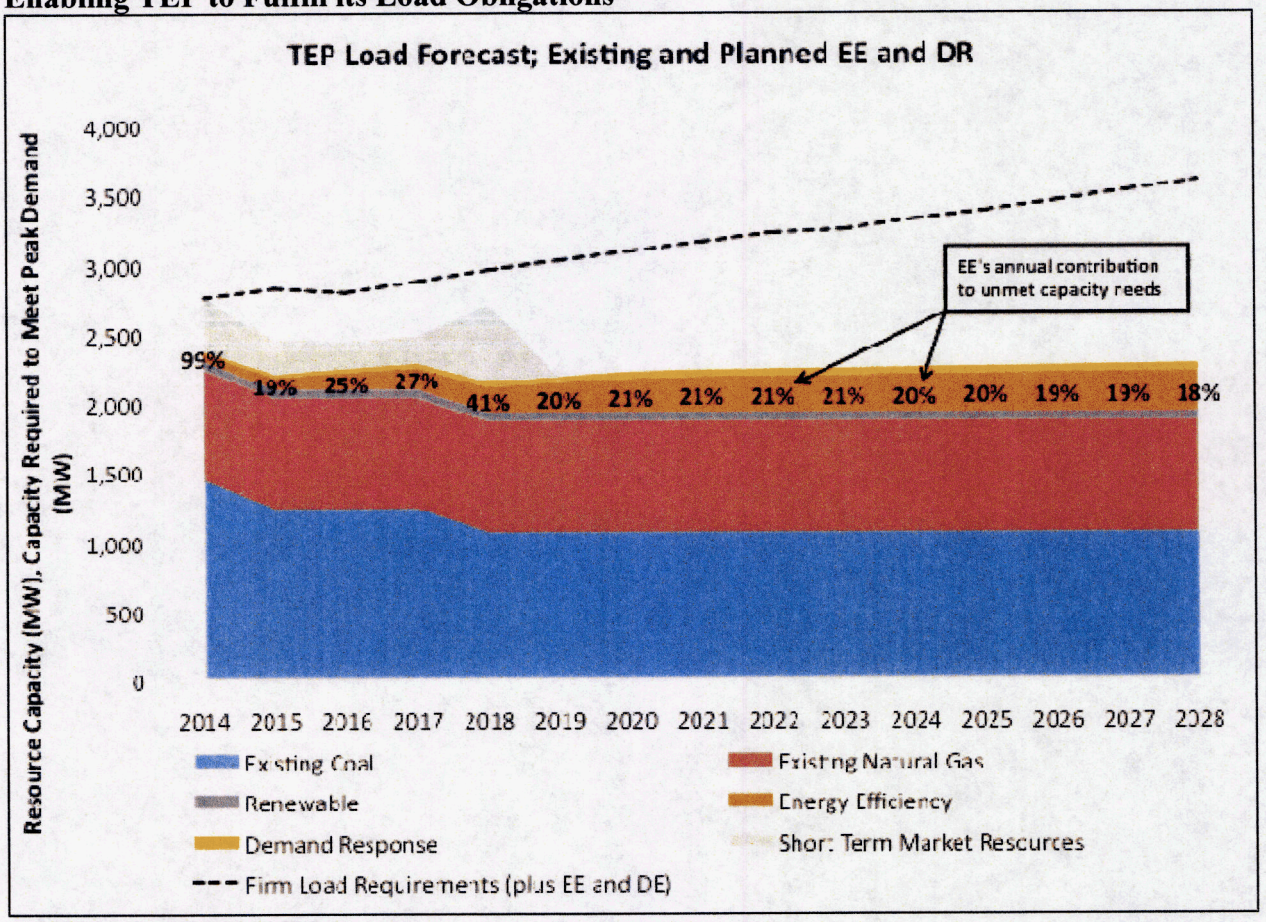
Data Sources: TEP 2014 IRP

Finding #2: Energy Efficiency Programs Make Significant Contributions Toward Enabling TEP to Fulfill its Load Obligations and Address its Capacity Shortfall.

EE programs make significant contributions toward enabling TEP to fulfill its load obligations and address its capacity shortfall. As shown in Figure SWEEP-7, Demand Side Management (DSM) programs contribute a major share of TEP's future additional capacity resources to meet capacity needs. Figure SWEEP-7 illustrates the fraction EE contributes to additional capacity resources to meet the unmet capacity needs in each year over this time horizon. As you can see, EE contributes ~22% of TEP's future additional capacity resources in from 2015-2028. In some years, such as 2018, DSM's contribution to TEP's additional capacity resources is as high as 41%.

Note that TEP assumes in its resource plan that EE resource contributions will level off after 2020, the final year of the EE Standard, and that less EE will be implemented post-2020. TEP has not provided any documentation for this assumption. SWEEP recommends that all cost-effective EE should continue to be pursued and implemented, including after the last year of the current EE Standard.

Figure SWEEP-7: Energy Efficiency Programs Make Significant Contributions Toward Enabling TEP to Fulfill its Load Obligations



Data Sources: TEP 2014 IRP.

Finding #3: From a ratepayer perspective, energy efficiency is the best and lowest-cost energy resource TEP can use to meet the needs of its customers

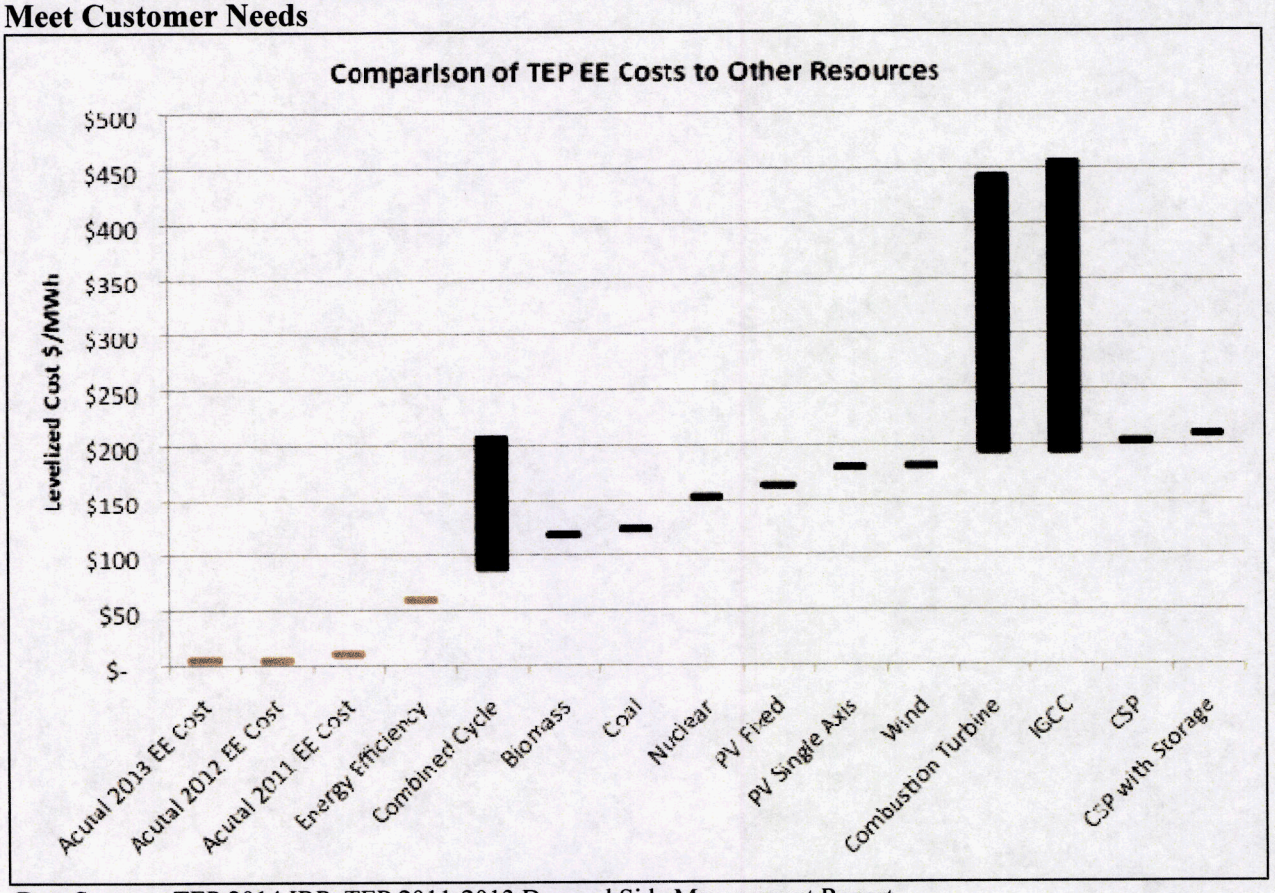
From a ratepayer perspective, EE is the best and lowest-cost energy resource TEP can use to meet the needs of its customers. As documented in TEP's 2014 IRP and annual demand side management plans, cost-effective EE is the lowest cost, cleanest, least-risky, and most economy-friendly resource. As shown in Figure SWEEP-8, investing in other resources would be more costly for ratepayers. For example, TEP estimates the next most affordable energy resource (a combined cycle natural gas plant) to 1.5-to-2 times more expensive than EE.

Notably TEP is estimating EE costs that are several times the actual cost of EE in recent years (see Figure SWEEP-8, at the lower left which shows TEP's actual cost of EE programs from 2011-2013). EE is still the lowest cost resource even when TEP estimates costs that are far higher than actual experience-to-date.

In fact, TEP plans to rely increasingly and significantly on natural gas to meet customer needs. For example, in 2020 and 2025 the TEP-planned natural gas additions are 4-times the 2020 and 2025 energy efficiency additions, respectively. Apparently this is TEP's plan as represented in its

IRP even though additional EE is available post-2020 and EE is much lower cost than the natural gas additions, as shown in Figure SWEEP-8.

Figure SWEEP-8: Energy Efficiency is the Least Expensive Energy Resource Available to Meet Customer Needs



Data Sources: TEP 2014 IRP, TEP 2011-2013 Demand Side Management Report

Finding #4: TEP's IRP Cleary Demonstrates the Need for Energy Efficiency Investment

The TEP 2014 IRP clearly demonstrates the need to invest in energy efficiency based on TEP's actual customer needs as established in TEP's 2014 IRP. If TEP under-invests in the EE resources documented in the 2014 IRP, and then has to add other resources to substitute for the energy efficiency resources identified in the TEP IRP, the total costs for TEP customers will be significantly higher (see SWEEP-8).

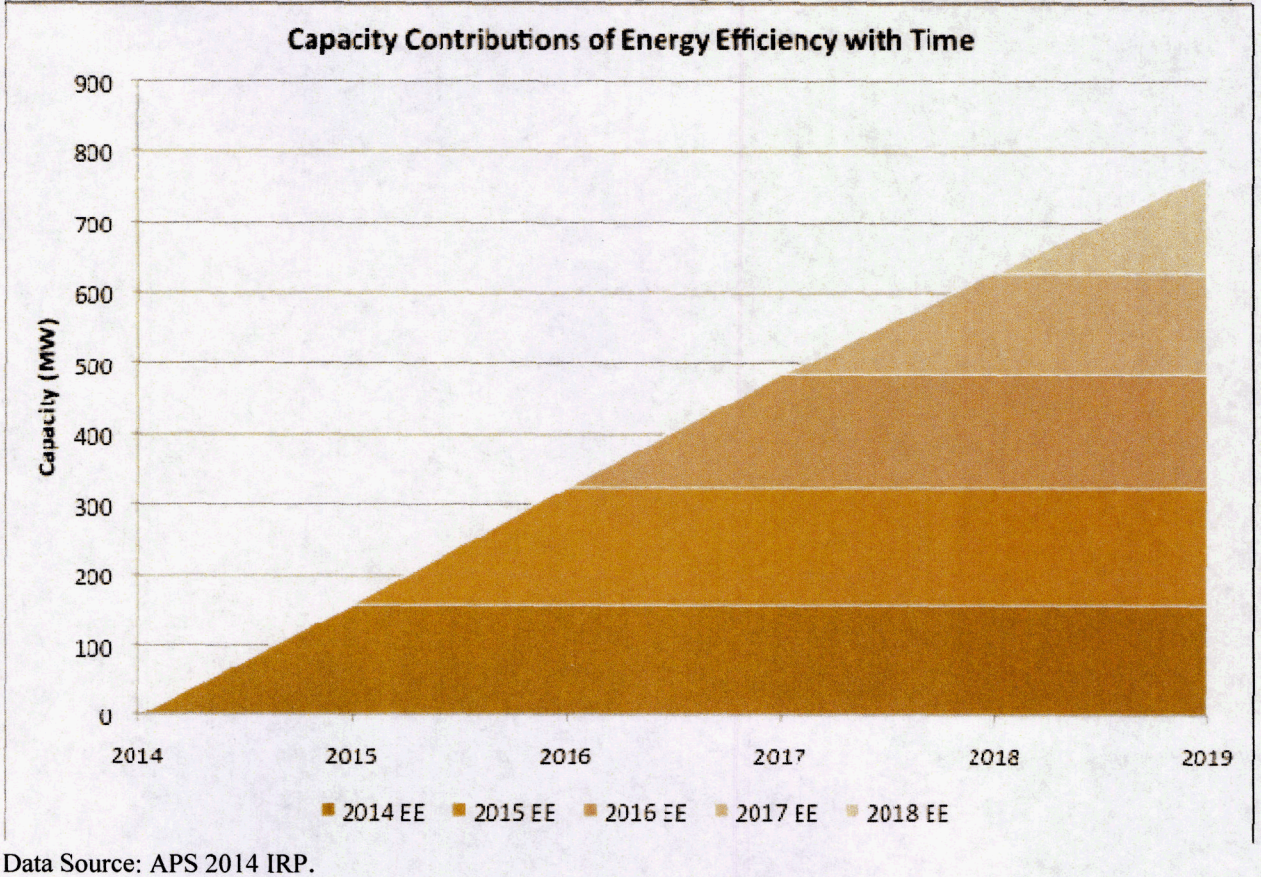
III. How Energy Efficiency Programs Meet Capacity Needs by Building Up the Energy Efficiency Resource Over Time

The 2014 Integrated Resource Plans (IRPs) of Arizona Public Service Company (APS) and Tucson Electric Power (TEP) illustrate several key points about how energy efficiency (EE) resources meet capacity needs by building up the EE resource over time.

Point #1: Energy Efficiency Resources Build Up Capacity Over Time

EE programs build up capacity resources over time, as customers make decisions on buildings, appliances, and equipment, and as EE measures are installed. For example, when an EE measure such as attic insulation is installed, that attic insulation will deliver capacity benefits in the year that it is installed and in subsequent years (as the insulation is not removed). In this way, EE resources implemented in any one year continue to deliver capacity benefits for multiple years. In addition, EE resources implemented in subsequent years build on the contribution of EE resources implemented earlier. See Figure SWEEP-9, which is based on data in the APS IRP.

Figure SWEEP-9: Energy Efficiency Builds Up Capacity Resources Over Time (APS IRP)



Data Source: APS 2014 IRP.

Point #2: Cost-Effective Energy Efficiency Built Up Over Time Provides Benefits Today

Cost-effective EE programs built up over time provide benefits today in addition to contributing to meet future capacity needs. Indeed, as soon as an EE measure is implemented, it will begin delivering energy, capacity, and other benefits. As a cost-effective resource, the EE programs will result in lower total costs for customers, and the benefits begin to accrue the moment the EE measures are installed. Therefore it does not make economic sense to delay the implementation of cost-effective EE, because delaying the implementation would, by definition, increase total customer costs.

Point #3: Energy Efficiency Resources Reduce Customers' Utility Bills Today

While EE programs are reducing total costs for customers over time, as a cost-effective resource, they are also helping customers to reduce their utility bills today. Customers who install EE measures as a result of the programs receive the direct benefit of a lower utility bill.

Point #4: Energy Efficiency Resources Should Be Built Up Over Time

By design, EE programs often piggyback on market opportunities, such as when customers buy a new home, replace an air conditioner or appliance, or change old or buy new equipment. EE programs are designed to build on and take advantage of these natural market opportunities for two reasons. First, it is easier and more effective to encourage a customer to purchase an EE option or upgrade when they are already thinking of making a purchase. Second, and very importantly, the cost to ratepayers for financial incentives during a natural market opportunity are lower than if the programs tried to encourage customers to retrofit their buildings. This practice results in lower program costs and lower costs for ratepayers. Therefore it is important for EE programs to "be in the market" and to capture these opportunities in the natural market, in all years, which also contributes to building up the EE resource over time. Each missed opportunity in the market will result in higher utility bills for that customer, and ultimately higher total costs for all ratepayers.

Point #5: Energy Efficiency Programs Help Support and Provide Flexibility for New Innovations and Opportunities

Traditional generation plants are "lumpy" investments. It takes years to build them, and once there is a commitment to building a future plant, the utility or owner cannot easily adjust plans. If the actual load turns out to be less than the forecast, the investment in the lumpy power plant becomes a sunk cost that ratepayers will be expected to pay. During this several year period, innovations and new alternatives generally are not considered or pursued.

EE programs can defer or eliminate the need for some large central-station power plants in the future. EE programs are diverse distributed resources so investments are not lumpy and large sunk costs can be avoided. The EE programs are responsive to changes in load (e.g., increases in new construction projects in the market result in increases in new construction energy savings). They are also flexible in that programs can be ramped up or geo-targeted to particular areas when needed. These characteristics provide more flexibility in system planning and operations. As a result they also support opportunities for new innovations.

Thank you for the opportunity to provide these comments on the 2014 IRPs of APS and TEP, and SWEEP's additional analysis and findings.

RESPECTFULLY SUBMITTED this 1st day of December 2014.

_____

Jeff Schlegel & Ellen Zuckerman
Southwest Energy Efficiency Project

ORIGINAL and 13 COPIES of the foregoing filed this 1st day of December 2014, with Docket Control, and electronically mailed to All Parties of Record.